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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/030,870	10/19/2001	Robert Boesnecker	32860-000181	8899
30596	7590	03/24/2005		
HARNESS, DICKEY & PIERCE, P.L.C. P.O.BOX 8910 RESTON, VA 20195			EXAMINER FAULK, DEVONA E	
			ART UNIT	PAPER NUMBER
			2644	

DATE MAILED: 03/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/030,870	<b>Applicant(s)</b> BOESNECKER, ROBERT	
	<b>Examiner</b> Devona E. Faulk	<b>Art Unit</b> 2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                            | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

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**DETAILED ACTION**

***Response to Arguments***

1. Applicant's arguments, filed 11/4/2004, with respect to the rejection(s) of claim(s) 1-16 under 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Smith.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1,2,4,5,7,14 rejected under 35 U.S.C. 103(a) as being unpatentable over Op De Beek et al. (U.S. Patent 4,628,530) in view of Smith (GB 2 265 519 A).

Regarding claim 1, Op De Beek discloses a method for operation of a loudspeaker, in which at least one oscillating coil is mounted on a surface in the form of a plate having predetermined characteristics (11, loudspeaker; coil is obviously present and obviously has some predetermined characteristics), comprising:

stimulating at least one coil to oscillate electrically by a sound source (obvious in function of loudspeaker);

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measuring the acoustic frequency response of this flat surface loudspeaker (microphone, 14; Figure 1);

determining a frequency curve based on the measured acoustic frequency response (16, frequency-analyzing unit; Figure 1);

determining an inverse frequency curve to the frequency curve (column 1, lines 50-55);

simulating the inverse frequency curve in a filter device as a transfer function of the filter device (column 2, lines 10-25);

and in an operating mode, compensating for the frequency response of the loudspeaker by the filter device, which is connected between the sound source and the flat surface loudspeaker, based upon the transfer function (column 9, lines 1-24; column 2, lines 10-64).

Op De Beek fails to teach of a method for operation of a flat surface loudspeaker. However, the concept of compensating for nonlinear characteristics of a flat panel loudspeaker was well known in the art at the time of filing as taught by Smith.

Smith discloses a flat loudspeaker and compensating for the nonlinear characteristics (page 4, lines 1-19). Thus it would have been obvious to use Op De Beek's method of operation with a flat loudspeaker in order to relinearize or rescale the incoming signal to give a displacement, which is proportional to the input signal.

Claim 2 claims the method of claim 1 with the exception that the transfer function of the filter device is simulated by digital filters. Op De Beek apparatus is to be implemented with DFTs and FFTs. This implies that any filter processing that is done is digital. Thus

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it would have been obvious to one of ordinary skill in the art to have the transfer function simulated by digital filters for the benefit of providing better equalization and providing an output signal with less distortion.

Claim 14 claims the method of claim 1, wherein at least one of oscillating coil has predetermined material characteristics. A coil is obviously present in a loudspeaker and it is obvious that it has some predetermined material characteristics. All elements of claim 14 are comprehended by claim 1. Therefore, claim 14 is rejected for reasons given above apropos of claim 14.

Regarding claim 4, Op De Beek discloses a loudspeaker (11, Figure 1) comprising at least one oscillating coil mounted on a surface in the form of a plate having predetermined characteristics which, when stimulated by electrical sound signals, causes this surface to oscillate in order to emit sound (11, loudspeaker; coil is obviously present and obviously has some predetermined characteristics); and

a filter device for the sound signals, connected upstream of the at least one oscillating coil, wherein a transfer function of the filter device is the inverse of a frequency response of the loudspeaker (column 1, lines 50-55; column 2, lines 10-60).

Op De Beek fails to teach of a flat surface loudspeaker. However, the concept of compensating for nonlinear characteristics of a flat panel loudspeaker was well known in the art at the time of filing as taught by Smith.

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Smith discloses a flat loudspeaker and compensating for the nonlinear characteristics (page 4, lines 1-19). Thus it would have been obvious to use Op De Beek's method of operation with a flat loudspeaker in order to relinearize or rescale the incoming signal to give a displacement, which is proportional to the input signal.

All elements of claim 5 are comprehended by claim 4 (column 2, lines 14-20).

Claim 7 claims the flat surface loudspeaker of claim 5 wherein the filter device includes a sample and hold element as the input element, connected via an analogue-to-digital converter to the digital filter, whose output is connected to a digital-to-analogue converter. Op De Beek as modified by Smith teaches of a re-linearising device (Figures 5 and 6) having a digital format converter (filter) and a memory (sample and hold element) connected as claimed (page 4, lines 8-19). All elements of claim 7 are comprehended by claim 5.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Op De Beek et al. (U.S. Patent 4,628,530) in view of Smith (GB 2 265 519 A) in further view of Yashima et al. (GB 2 289 185).

Claim 3 claims the method of claim 2, wherein the transfer function is formed by FIR (Finite Impulse Response filter), whose filter coefficients are derived from the inverse frequency curve. Op De Beek as modified by Smith fails to teach that the transfer function is formed by an FIR filter. Yashima teaches of the coefficient data of a non-recursive digital filter set to the transfer function (H3), which represents the inverse characteristics of the frequency-

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amplitude characteristic (page 18, lines 11-18). Non-recursive digital filter is alternative terminology for FIR filter. Thus it would have been obvious to one of ordinary skill in the art to use Yashima's concept of a transfer function formed as claimed for the benefit of matching the acoustic radiation characteristic of the sound source to the replay characteristics of the speaker.

5. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Op De Beek et al. (U.S. Patent 4,628,530) in view of Smith (GB 2 265 519 A) in further view of Craven et al. (U. S. Patent 6,760,451).

Claim 6 claims the flat surface loudspeaker of claim 5, wherein the filter device is formed by FIR (Finite Impulse Response) filters. Op De Beek as modified by Smith fails to teach that the transfer function is formed by an FIR filter. Craven teaches of FIR filters that can be used as compensating filters (column 9, lines 60-64). It would have been obvious to use FIR filters to form the transfer function to have a more stable operation.

Claim 9 claims the flat surface loudspeaker of claim 6, wherein the filter device includes a sample and hold element as the input element, connected via an analogue-to-digital converter to the digital filter, whose output is connected to a digital-to-analogue converter. Op De Beek as modified by Smith and Craven teaches of a re-linearising device (Figures 5 and 6) having a digital format converter (filter) and a memory (sample and hold element) connected as claimed (page 4, lines 8-19). All elements of claim 9 are comprehended by claim 6.

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6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Op De Beek et al. (U.S. Patent 4,628,530) in view of Smith (GB 2 265 519 A) in further view of Tanaka (U.S. Patent 5,081,604).

Claim 8 claims the flat surface loudspeaker of claim 5 wherein the filter device is equipped with a digital signal processor. Op De Beek as modified by Smith fails to teach of a filter that is equipped with a digital signal processor Tanaka teaches that an FIR digital filter is designed to execute digital filtering operations in order to provide a desired frequency-amplitude characteristic by using a digital signal processor (column 1, lines 42-53). Thus it would have been obvious to use Yashima's concept of a filter equipped with a digital signal processor in order to provide the ability to perform digital operations.

7. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Op De Beek et al. (U.S. Patent 4,628,530) in view of Smith (GB 2 265 519 A) in further view of Craven et al. (U. S. Patent 6,760,451) in further view of Tanaka (U.S. Patent 5,081,604).

Claim 10 claims the flat surface loudspeaker of claim 6, wherein the filter device is equipped with a digital signal processor. Op De Beek as modified by Smith and Craven fail to teach of a filter that is equipped with a digital signal processor. Tanaka teaches that an FIR digital filter is designed to execute digital filtering operations in order to provide a desired frequency-amplitude characteristic by using a digital signal processor (column 1, lines 42-53). Thus it would have been obvious to use Yashima's concept of a filter equipped with a



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digital signal processor in order to provide the ability to perform digital operations.

Claim 11 claims the flat surface loudspeaker of claim 7, wherein the filter device is equipped with a digital signal processor. Op De Beek as modified by Smith and Craven fail to teach of a filter that is equipped with a digital signal processor. Tanaka teaches that an FIR digital filter is designed to execute digital filtering operations in order to provide a desired frequency-amplitude characteristic by using a digital signal processor (column 1, lines 42-53). Thus it would have been obvious to use Yashima's concept of a filter equipped with a digital signal processor in order to provide the ability to perform digital operations.

Claim 12 claims the flat surface loudspeaker of claim 9, wherein the filter device is equipped with a digital signal processor. Op De Beek as modified by Smith and Craven fail to teach of a filter that is equipped with a digital signal processor. Tanaka teaches that an FIR digital filter is designed to execute digital filtering operations in order to provide a desired frequency-amplitude characteristic by using a digital signal processor (column 1, lines 42-53). Thus it would have been obvious to use Yashima's concept of a filter equipped with a digital signal processor in order to provide the ability to perform digital operations.

#### **Conclusion**

8. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Devona E. Faulk whose telephone number is 703-305-4359. The examiner can normally be reached on 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 703-305-4040. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**SINH TRAN**  
**SUPERVISORY PATENT EXAMINER**

DEF